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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,580	01/28/2002	Robert F. Gazdzinski	RFG.015A	7928
27299	7590	01/10/2005	EXAMINER	
GAZDZINSKI & ASSOCIATES 11440 WEST BERNARDO COURT, SUITE 375 SAN DIEGO, CA 92127			LE, TRAN Q	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**Application No. **UK**

10/059,580

Applicant(s)

GAZDZINSKI, ROBERT F.

Examiner

Tran Q. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 11-20 is/are rejected.
- 7) ☒ Claim(s) 8-10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                | Paper No(s)/Mail Date: _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/16/02</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities:
  - a) Figures 10c and 10d are not disclosed in the Brief Description of the Drawings section as mentioned in the specification on p. 30, line 26 and p. 32, line 2.
  - b) Figure 10d is not being discussed in details in the Detailed Description of the Preferred Embodiments section of the specification.
  - c) Element named "chamber 204" on p. 20, line 10 should be corrected to be 304.

Appropriate correction is required.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show elements 330, 332 (p. 20, line 1), 335 (p. 18, line 15), X and Y (p. 23, line 25), 1010, 1012 (p.32, line 10), 1037 (p. 32, line 23), 1070 (p. 33, line 2), 1072 (p. 33, line 2), and 1076 (p. 33, line 7) as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).
3. The drawings are objected to because Figure 10d is missing.
4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a digital data processor as specified in claim 19 and an optical modulator coupling to the

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processor as specified in claim 20 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 6, 19-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation "an optical switch adapted to selectively switch a device from one state to another" is not disclosed in the specification of the invention. Therefore, it is unclear how the optical switch is connected within the optical communication apparatus.

Regarding claims 19-20, it is not clear about the digital data processor and the optical modulator that is coupled to the processor.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-6 are rejected under 35 U.S.C. 102(a) as being anticipated by Liu et al, "Observation of coherent optical information storage in an atomic medium using halted light pulses", Nature, (January 2001) (advanced publication), herein after referred to as "Liu".

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Regarding claim 1, Liu discloses a method of controlling the propagation speed of light pulses that functions as an optical communications apparatus, composing: a first coherent light source adapted to produce first electromagnetic radiation (p. 490, col. 2, par. 1, lines 1-5, the 'probe' laser is the first coherent light source to produce the first electromagnetic radiation); and an atomic medium adapted to substantially alter the speed of propagation of the electromagnetic radiation therethrough (p. 490, col. 2, par. 1, lines 1-5); wherein the first electromagnetic radiation is used to transfer information from one location to at least one second location (p. 490, col. 2, par. 1, coherent information is carried by the probe pulse propagating through the atomic medium for storage or delay up to 1 ms and the stored coherence is transferred back into the radiation field).

Regarding claim 2, Liu discloses the atomic medium comprises at least in part sodium (Na) atoms (p. 490, col. 2, par. 1, line 10).

Regarding claim 4, Liu teaches a second coherent light source adapted to produce second electromagnetic radiation (p. 490, col. 2, par. 1, lines 1-5, the 'coupling' laser is the second light source to produce the second electromagnetic radiation), and the second electromagnetic radiation cooperating with the atomic medium to provide altering of the speed of propagation (p. 490, col. 2, par. 1).

Regarding claim 5, Liu also discloses a delay device adapted to selectively delay the propagation of the first electromagnetic radiation to at least one second location (p. 490, col. 2, par. 1, the magnetically trapped, atomic cold cloud (MTACC) provides selective propagation delay for the probe laser pulse).

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Regarding claim 6, as it is understood in view of 112 problem, Liu further teaches an optical switch adapted to selectively switch a device from one state to another ((p. 490, col. 2, par. 1, lines 13-19, sudden turn-off of the coupling laser can only be obtained by means of an optical switch).

9. Claims 1, 4, 7, 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Eberly et al. (US Patent 4,406,003).

Regarding claim 1, 4 and 7, Eberly discloses an optical transmission system that functions as a method of conditioning light energy in an optical communication system (col. 1, lines 5-17), comprising: providing first electromagnetic radiation ( $\lambda_b$ , fig. 6) having a plurality of information associated therewith (col. 7, lines 23-30), providing second electromagnetic radiation (14, fig. 6 and col. 3, lines 52-54); providing an atomic medium (12, fig. 6 and col. 3, lines 38-44); irradiating the atomic medium with the first electromagnetic radiation ( $\lambda_b$ , fig. 6 and col. 3, lines 26-40), and selectively irradiating the medium with the second radiation (14, fig. 6 and col. 3, lines 52-54), the second radiation at least in part controlling the propagation of the first radiation through the medium (col. 3, lines 52-54 and col. 7, lines 23-30); wherein the act of selectively irradiating comprises controlling the application of the second radiation to the atomic medium based on receiving input from the communication system (14, fig. 6, col. 3, lines 52-54 and col. 7, lines 23-30, it is inherently understood that the excitation unit 14 is controlled by an input from the communication system to

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selectively control the propagation of the input pulses through the channel/medium).

Regarding claim 11, Eberly discloses a method of obtaining information from light energy (fig. 6 and col. 1, lines 34-45 and lines 63-65), comprising: providing first electromagnetic radiation having a plurality of information associated therewith ( $\lambda_b$ , fig. 6), providing second electromagnetic radiation (14, fig. 6); providing third electromagnetic radiation ( $\lambda_a$ , fig. 6); providing an atomic medium (12, fig. 6 and col. 3, lines 38-44); irradiating the atomic medium with the first electromagnetic radiation ( $\lambda_b$ , fig. 6 and col. 3, lines 26-40); and selectively irradiating the medium with the second radiation (radiation from excitation unit 14, fig. 6) so as to alter the propagation speed of the first radiation within the medium (col. 1, lines 11-17 and col. 6, lines 61-62), interrogating the medium using the third radiation ( $\lambda_a$ , fig. 6 and col. 3, lines 31-39); and obtaining the information from the first radiation based on the interaction of at least the third radiation with the first radiation (col. 4, lines 50-54, the step of obtaining the information is inherently understood based on the co-propagating of the first and third radiation through the channel/medium and the interaction of more than one input pulse within the medium that results in output signals obtained at the output end of the channel/medium).

Regarding claim 12, Eberly discloses the step of generating at least one light pulse based on the act of obtaining (col. 1, lines 52-58).

Regarding claim 13, Eberly discloses the step of transmitting at least one light pulse over an optical communications system (col. 1, lines 18-22).



Regarding claim 14, Eberly further discloses the controlling acts of selectively irradiating and transmitting at least one light pulse over the optical communications system so as to create a desired temporal relationship between the first and at least one light pulse (col.1, lines 52-58).

10. Claims 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Jewel et al. (US Patent 4,741,587).

Regarding claim 15, Jewell discloses an optical communication system similar to an optical pulse conditioning apparatus, comprising: a medium (24, fig. 2) adapted to receive modulated light energy (23, fig. 2) from a first light source (18, fig. 2, and col. 5, lines 58-61, a transmission medium 24 is used to receive modulated light energy in a form of the pulse train 23 generated from radiation source as shown in fig. 2); a second source of electromagnetic energy (28-1, fig. 2) adapted to irradiate at least a portion of said medium (24, fig. 2) using electromagnetic energy (col. 6, lines 13-15), said electromagnetic energy altering the propagation of said modulated light energy through said medium (col. 6, lines 13-20); and controller apparatus operatively controlling said irradiation of said medium by said electromagnetic energy so as to control at least one physical parameter of said modulated light energy (col. 6, lines 13-20, the use of the controller apparatus is inherently understood in order to control the pump radiation to the medium, i.e. pump source 28 can be controlled to increase or decrease the transfer of energy from the pump source to the waveguide 24).

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Regarding claim 16, Jewell discloses at least one parameter comprises pulse width (col. 6, lines 15-17).

Regarding claim 17, Jewell discloses at least one parameter comprises the chromatic content of the modulated light energy (col. 5 lines 45-47).

Regarding claim 18, Jewell discloses at least one parameter comprises the amplitude of at least one constituent wavelength of energy within the modulated light energy (col. 6, lines 15-17).

11. Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Huber (US Patent 5,373,389).

Regarding claim 15, Huber discloses an optical communication system similar to an optical pulse conditioning apparatus, comprising: a medium (14, 16, fig. 1) adapted to receive modulated light energy (output of 30, fig. 2) from a first light source (10, fig. 2); a second source of electromagnetic energy (20, 28, fig. 2) adapted to irradiate at least a portion of said medium (14, 16, fig. 2) using electromagnetic energy (20, 28, fig. 2), said electromagnetic energy altering the propagation of said modulated light energy through said medium (col. 4, lines 53-68, the modulated light energy propagating through the medium 14 can be altered by adjusting the interferometer 20 with a DC voltage input at the terminal 28 or by adjusting the temperature of the optical substrate in which the interferometer 28 is fabricated); and controller apparatus operatively controlling said irradiation of said medium by said electromagnetic energy so as to control at least one physical parameter of said modulated light energy (29, fig 1 and col. 4,

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lines 53-68, the controller 29 is used to control the voltage input to the heater 25 so as to control the temperature of the optical substrate).

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu as claimed above, and further in view of Phillips et al, "Storage of Light in Atomic Vapor", Physical Review Letters 86, 783 (January 2001), herein after referred to as "Phillips".

Regarding claim 3, Liu discloses all the aspects of the claimed invention as set forth in the rejection to claim 1 above, except fails to teach the medium comprises at least in part Rubidium atoms. However, Phillips teaches the medium comprises at least in part Rubidium (Rb) atoms (see abstract and p. 783, par. 1 and par.2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use Rubidium to modify the atomic medium of Liu. One skill in the art would have been motivated to use a different material like Rubidium held at different temperatures to generate a varied type of resonance based on a Zeeman (spin) conherence of the Rb vapor so as to show a broader scope of utilizing a variety of materials for

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the medium for selectively controlling the propagation and parameters of light energy traveling through the medium.

14. Claims 19-20 are rejected under 35 U.S.C. 103(b) as being unpatentable over Jewel as claimed above, and further in view of Suyama (US Pat. No. 5,535,050).

Regarding claims 19 and 20, Jewel discloses all the aspects of the claimed invention as set forth in the rejection to claim 15 above, except fails to teach the controller apparatus comprises a digital data processor and an optical modulator which is operatively coupled to the processor and adapted to modulate the electromagnetic energy based on signals received from the processor. However, Suyama, in US Pat. No. 5,535,050, teaches a controller apparatus comprises a digital data processor and an optical modulator which is operatively coupled to the processor and adapted to modulate the electromagnetic energy based on signals received from the processor (44, 48, fig. 6). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a pump source with a control circuit and a modulation circuit such as the one of Suyama for the pump source in the optical transmission system of Jewel in order to further control the physical parameters of modulated light energy.

15. Claims 19-20 are rejected under 35 U.S.C. 103(b) as being obvious by Huber (US Patent 5,373,389).

Regarding claims 19 and 20, Huber discloses all the aspects of the claimed invention as set forth in the rejection to claim 15 above, except fails to teach the controller apparatus comprises a digital data processor and an optical modulator which is operatively coupled to the processor and adapted to modulate the electromagnetic energy based on signals received from the processor. However, it is obvious that the temperature adjusting device 29 can be controlled by a digital data processor (not shown) and an optical modulator (20, fig. 2, the Mach Zehnder interferometer behaves as an optical modulator) which is operatively coupled to the processor (fig. 1, it is inherently understood that there is a digital data processor coupling to the modulator 20 to control the temperature adjusting device 29) and adapted to modulate the electromagnetic energy based on signals received from the processor (fig. 1 and col. 4, lines 48-52).

#### ***Allowable Subject Matter***

16. Claims 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 8, the prior arts of record also fails to teach the specific act of receiving input comprises receiving information relating to dispersion of light energy pulses within said system as cited in claim 8. In addition, the prior arts of record also fails to teach the specific step of diverting at least a portion of

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the first radiation for propagating within the communication system apart from the atomic medium and the specific act of receiving input comprises receiving information relating to dispersion of at least portion of the first radiation as cited in claims 9 and 10.

### ***Conclusion***

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Rentzepis (US Patent No: 4,209,690) is cited to show induced absorbed elements by using the pump to produce an excited state for an active medium. Elements may operate as extremely rapid shutters, switches, modulators, pulse sharpeners, etc.

Hahn et al. (US Patent No: 3,714,438) is cited to show coherent light or other coherent traveling wave energy is passed through a resonant medium which provides pulse shapers, delay lines, storage elements and logic elements.

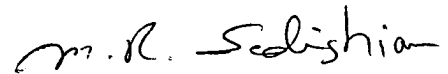
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran Q. Le whose telephone number is (571)272-2046. The examiner can normally be reached on 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TQL



**M. R. SEDIGHIAN**  
**PRIMARY EXAMINER**